
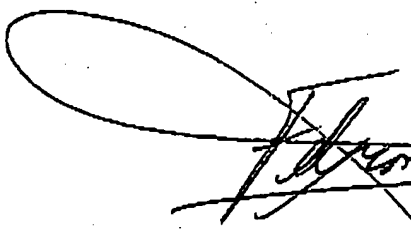


# CERTIFICATION

I, drs. F. de Groot, a sworn translator of Dutch nationality,  
of J. Boezerstraat 83, 2552 DL DEN HAAG, the Netherlands,  
do hereby declare that, to the best of my knowledge and belief, the  
attached translation prepared by me is a true and accurate  
translation of German patent specification DE 12 20 688.

Signed this 28<sup>th</sup> day of November, 2005



- translation of German patent publication Auslegeschrift  
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Title: Gas bottle valve for fit-on gas pressure regulators

The invention relates to a gas bottle valve for fit-on gas pressure  
regulators containing a valve-actuating control membrane, with pressure  
10 relief valve closing piece axially slidable in the valve housing, in which the  
shut-off valve closing piece is slidably and concentrically arranged.

Known are gas bottle valves where the pressure regulator on the one  
hand and the valve controlled by it on the other are accommodated in  
mutually detachable construction parts. The valve itself is permanently  
15 fixedly connected with a pressure gas stock container and a pressure gas  
line, respectively. The pressure regulator, which generally contains the  
valve-actuating control membrane, is, for the purpose of exchangeability,  
connected with the gas bottle valve so as to allow easy coupling. The control  
membrane of the fitted-on gas pressure regulator acts, via a plunger  
20 arranged in the valve housing, on the movable valve closing piece, whose  
seat is arranged in the interior of a pressure relief valve closing piece which  
is slidably fitted in a corresponding bore of the bottle valve housing. At its  
outwardly directed end, this closing piece carries a flange which abuts  
against a corresponding shoulder, serving as seat, in the housing bore with  
25 interposition of a sealing ring, and which is pressed against this seat by a  
strong spring. When the pressure inside the stock bottle or the pressure gas  
line exceeds a defined measure, the pressure relief valve closing piece is  
raised, against the spring pressure, whereby the pressure relief valve  
formed by this closing piece and its seat, is opened.

30 This construction, however, has the disadvantage that the pressure  
relief valve is connected in parallel with the actual gas bottle valve,  
whereby the gas flowing out of the pressure relief valve ends up via the gas  
pressure regulator into the connected line to the consumer. When the

consumer line is closed, further possibilities must be provided to let off the gas.

In another known gas bottle valve, where likewise the pressure regulator on the one hand and the valve controlled by it on the other are accommodated in mutually detachable construction parts, the valve housing  
5 connected with the pressure bottle is provided with a side bore, which is in communication with the pressure space of the bottle and in which a safety valve is arranged. This construction avoids the disadvantage that the gas flowing out of the pressure relief valve ends up in the line to the consumer,  
10 but on the other hand has the disadvantage that in the valve housing, laterally, bores of great diameter for taking up further possibly projecting construction parts are provided, which render the manufacture of the valve more expensive and under certain circumstances are not desirable on other grounds either.

Known furthermore is a quick-release valve with a regulating member keeping the valve closing piece in the closing condition and capable, in an inactive position, of being brought thereto, where this member is constructed as a disc which is arranged between closing piece and a support and is detachable. In the known quick-release valve the discharge opening  
20 of the valve housing closable by the closing piece is provided with a sealing disc. The closing piece is fitted in a bore of the housing with a sealing ring. The bore is widened at its end and takes up a bored socket plug, which is held by a cap nut. The closing piece has a stem extending through the socket plug, which in turn carries two mutually parallel lugs, between which the support of the regulating member is arranged. In this valve construction,  
25 the above-described disadvantages in gas bottle valves for fit-on gas pressure regulators do not occur.

Known furthermore is a gas bottle valve of the above-described type where the valve stem is connected with the movable valve closing piece so in  
30 a self-braking and screw-adjustable manner, while this is secured against

turning. The elastic sealing material attached to the closing piece can abut the plunger. The valve is otherwise constructed in the same way as the initially outlined valve, in that namely the seat of the valve closing piece actuated by the gas pressure regulator is arranged in the interior of a pressure relief valve closing piece. In this construction too, the disadvantage exists that the thus built pressure relief valve is connected in parallel, and that also the gas flowing from the pressure relief valve ends up in the line to the consumer.

Known furthermore is a fit-on regulator, in particular for fluidized gases, in which the membrane-controlled gas pressure regulator, through a quick-release fastener, can be fitted, ready to operate, on a bottle valve and is provided with a device for opening and closing the bottle valve. In this apparatus, a regulating device is provided, which allows the regulator to be taken off and fitted on only when the bottle valve is closed. To that end, over the shut-off valve sealing with the bottle pressure, a membrane is arranged, which serves on the one hand for the sealing of the pressure space over this valve and which on the other hand transfers the pressing movement of the opening stem onto the valve closing piece. This membrane serves at the same time as sealing for a safety valve. This is in communication with the bottle interior via several bores at the edge of the bottle valve. These bores, which are located around the shut-off valve proper, terminate in a circular ring channel, which is formed by two ring-shaped, membrane-covered sealing edges. The membrane is tensioned by a spring lying on a plate. The gas flowing out through the response of the safety valve runs past the lower part of the regulator into the atmosphere. This valve construction has the disadvantage of an extremely laborious structure, in which the bottle valve neck must be provided with several bores and in which moreover a particular sealing consisting of two rings is constructed.

The object of the invention is therefore to construct a gas bottle valve of the aforementioned type, such that it enables, with its simple structure, a

flowing off of the gas into the open upon response of the safety valve. This object is realized by the invention in that the pressure relief valve closing piece is sealed by a ring sealing opposite the pressure space, and the wall of the valve housing, in the space between the ring sealing and the valve seat of the pressure relief valve, is provided with an opening terminating in the open.

In a gas bottle valve with a piston-shaped pressure relief valve closing piece, which at its end proximal to the regulator connection, has a flange, of which one side cooperates sealingly with the valve seat of the pressure relief valve and on the opposite side of which acts a spring, supported in the valve housing, in closing direction, a further elaboration of the invention consists in the feature that the side of the flange cooperating with the valve seat is proximal to the regulator connection.

A construction that is very expedient in the manufacture consists in the feature that the valve seat for the pressure relief valve closing piece and the valve seat for the shut-off valve closing piece are arranged on the side of an intermediate wall that faces the interior of the valve housing, which extends through the valve housing in the vicinity of the end thereof carrying the regulator connection. Then the two valve seats can be disposed in one plane or approximately one plane.

In the drawing, an embodiment of the invention is schematically elucidated.

The upper part 1 of the valve housing contains the fastening groove 2 for the fit-on gas pressure regulator (not shown) as well as the sealing ring 3 for the sealing thereof. Moreover, the upper part 1 carries the valve seat 4 for the shut-off valve closing piece. The distance between the valve seat 4 and the middle of the fastening groove 2 is precisely ensured in the one-piece manufacture.

Arranged concentrically with the valve seat 4 is the valve seat 5 of the safety valve.

The lower part 6, which is connected with the upper part through a screw connection, carries the screw thread 7 for the bottle and is provided with a let-off opening 8 for the safety valve.

Inside a bore in the bottle lower part 6, the stem 9 of the pressure relief valve closing piece 9  $\alpha$  is bearing-mounted, which is under the pressure of the closing spring 10, which is supported against the rear side of the flange provided on the pressure relief valve closing piece and presses this with a laid-in sealing ring 9  $b$  against the valve seat 5. The stem 9 is furthermore sealed in a self-acting and axially movable manner by the ring sealing 11, which is recessed in a groove 9  $c$ .

In the excess pressure closing piece 9  $\alpha$ , a bore 12 is provided which is provided with a shoulder on which is supported the closing spring 13 for the shut-off valve closing piece 13 $\alpha$ , which is integrally formed with the plunger 14. Thus, the connecting dimension  $h$ , that is, the distance from the upper plunger tip 14  $\alpha$  to the middle of the fastening groove 2, is advantageously determined solely by the two construction parts 1 and 13  $\alpha$ , 14.

Since the safety valve 9, 5 is not connected in parallel with the shut-off valve 13 $\alpha$ , 4, the gas flowing from the safety valve can flow into the open immediately. The safety valve opens, since the surface of the face side of the pressure relief valve closing piece acted upon in opening direction by the gas pressure is larger than the surface of the opposite face side.

A further advantage of the construction represented consists in the fastening thread 15 between the parts 1 and 6 only needing to effect a mechanically fixed, but not a gas-tight connection.

A further advantage of the gas bottle valve represented consists in its being constructed from a very small number of component parts, which are all simple to manufacture as a rotatable solid.

## CLAIMS

1. A gas bottle valve for fit-on gas pressure regulators containing a valve-actuating control membrane, with pressure relief valve closing piece  
5 axially slidable in the valve housing, in which the shut-off valve closing piece is slidably and concentrically arranged, characterized in that the pressure relief valve closing piece (9) is sealed by a ring sealing (11) opposite the pressure space, and the wall of the valve housing (1, 6), in the space  
10 between the ring sealing and the valve seat (5) of the pressure relief valve (5, 9b), is provided with an opening (8) terminating in the open.
2. A gas bottle valve according to claim 1, with a piston-shaped pressure relief valve closing piece, which at its end proximal to the regulator connection, has a flange, of which one side cooperates sealingly with the valve seat of the pressure relief valve and on the opposite side of which acts  
15 a spring, supported in the valve housing, in closing direction, characterized in that the side of the flange (9 a) cooperating with the valve seat (5) faces the regulator connection.
3. A gas bottle valve according to claim 1 or 2, characterized in that the valve seat (5) for the pressure relief valve closing piece (9) and the valve  
20 seat (4) for the shut-off valve closing piece (13 a) are arranged on the side of an intermediate wall that faces the interior of the valve housing (1, 6), which wall extends through the valve housing in the vicinity of the end thereof carrying the regulator connection.
4. A gas bottle valve according to claims 1 to 3, characterized in that  
25 the two valve seats (4, 5) are in one plane or approximately in one plane.